

In the United States Patent and Trademark Office

Appn. Number: \_\_\_\_\_

Appn. Filed: \_\_\_\_\_

Applicant(s): John A. Twardch

Appn. Title: Ellipsometric Investigation of Thin Films

Examiner/GAU: \_\_\_\_\_ 1324

Mailed: U.S. Application

At: \_\_\_\_\_

Information Disclosure Statement

Commissioner of Patents and Trademarks  
Washington, District of Columbia 20231

Sir:

Attached is a completed Form PTO-1449 and copies of the pertinent parts of the references cited thereon.

Following are comments on these references pursuant to Rule 98:

PATENTS

Patents which describe ellipsometric monitoring of thin films are:

Patent No. 6,573,999 to Yang;  
Patent No. 6,349,594 to Yabe;  
Patent No. 5,486,701 to Norton et al.;  
Patent No. 5,798,837 to Aspnes et al.;  
Patent No. 4,105,338 to Kuroha;  
Patent No. 5,181,080 to Fanton et al.;  
Patent No. 4,826,321 to Coates et al.;  
Patent No. 5,910,842 to Piwonka-Corle et al.;  
Patent No. 5,517,312 to Finarov;

Patent No. 6,278,519 to Rosenscwaig et al.;  
Patent No. 4,899,055 to Adams;  
Patent No. 5,798,837 to Aspnes et al.;  
Patent No. 5,793,480 to Lacey et al.;  
Patent No. 5,900,939 to Aspnes et al.;  
Patent No. 5,595,916 to Fujimura et al.;  
Patent No. 6,605,482 to Celii et al.; and

Patent Application No. US 2002/0176081 A1.

Patents which discuss monitoring witness samples are:

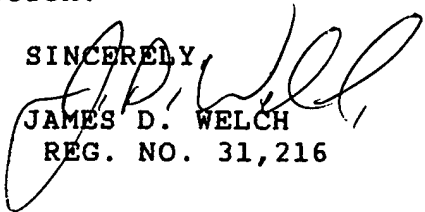
Patent No. 6,278,809 to Johnson et al.;

Patent No. 5,871,805 to Lemelson;

SCIENTIFIC PAPER

A relevant Scientific Paper is titled "Data Analysis for Spectroscopic Ellipsometry", Thin Solid Films, 234 (1993) is disclosed as it defines parameters  $N = \cos(2\theta)$ ;  $C = \sin(2\theta)\cos(\phi)$  and  $S = \sin(2\theta)\sin(\phi)$  which are applied in the preferred embodiment of the disclosed invention.

SINCERELY,

  
JAMES D. WELCH

REG. NO. 31,216

Form PTO-1449  
ISSN: 1-204

U.S. DEPARTMENT OF COMMERCE  
PATENT AND TRADEMARK OFFICE

ATTY. DOCKET NO.

SERIAL NO.

**LIST OF PRIOR ART CITED BY APPLICANT**  
(Use as many sheets as necessary)

APPLICANT

*Johr a Tiwald*

FILING DATE

GROUP

**U.S. PATENT DOCUMENTS**

| EXAMINER<br>INITIAL | DOCUMENT NUMBER | DATE   | NAME               | CLASS | SUBCLASS | FILING DATE<br>IF APPROPRIATE |
|---------------------|-----------------|--------|--------------------|-------|----------|-------------------------------|
| AA                  | 6573999         | 6/2003 | Yang.              | 356   | 632      |                               |
| AB                  | 6349594         | 2/2002 | Yabe               | 73    | 150      |                               |
| AC                  | 5484701         | 1/1996 | Norton et al.      | 250   | 372      |                               |
| AD                  | 5798837         | 8/1998 | Arpner et al       | 356   | 369      |                               |
| AE                  | 4105338         | 8/1978 | Kuroha             | 356   | 118      |                               |
| AF                  | 5181080         | 1/1993 | Fanton et al       | 356   | 369      |                               |
| AG                  | 4826321         | 5/1989 | Coates et al.      | 356   | 351      |                               |
| AH                  | 5910842         | 6/1999 | Piwonka-Gude et al | 356   | 369      |                               |
| AI                  | 5517312         | 5/1996 | Finarov            | 356   | 386      |                               |
| AJ                  | 6228519         | 8/2001 | Rosenchans et al   | 356   | 369      |                               |
| AK                  | 4899055         | 2/1990 | Adams              | 250   | 372      |                               |

**FOREIGN PATENT DOCUMENTS**

|    | DOCUMENT NUMBER | DATE | COUNTRY | CLASS | SUBCLASS | TRANSLATION |    |
|----|-----------------|------|---------|-------|----------|-------------|----|
|    |                 |      |         |       |          | YES         | NO |
| AL |                 |      |         |       |          |             |    |
| AM |                 |      |         |       |          |             |    |

**OTHER PRIOR ART (Including Author, Title, Date, Pertinent Pages, Etc.)**

|    |             |                                      |
|----|-------------|--------------------------------------|
| AR | OpSal et al | Pub No US 2002/0176081 A1,           |
|    |             | Nov. 28, 2002, Serial No. 10/138,984 |
| AS |             |                                      |

|          |                 |
|----------|-----------------|
| EXAMINER | DATE CONSIDERED |
|----------|-----------------|

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Form PTO-1449  
REV. 7-94

U.S. DEPARTMENT OF COMMERCE  
PATENT AND TRADEMARK OFFICE

ATTY. DOCKET NO.

SERIAL NO.

**LIST OF PRIOR ART CITED BY APPLICANT**  
(Use several sheets if necessary)

APPLICANT

*John A. Tward*

FILING DATE

GROUP

**U.S. PATENT DOCUMENTS**

| EXAMINER<br>INITIAL | DOCUMENT NUMBER | DATE   | NAME            | CLASS | SUBCLASS | FILING DATE<br>IF APPROPRIATE |
|---------------------|-----------------|--------|-----------------|-------|----------|-------------------------------|
| AA                  | 5798837         | 8/1998 | Aspner et al.   | 358   | 369      |                               |
| AB                  | 5793480         | 8/1998 | Lacey et al.    | 358   | 77       |                               |
| AC                  | 5900939         | 5/1999 | Aspner et al.   | 358   | 369      |                               |
| AD                  | 5595916         | 1/1997 | Fujimura et al. | 437   | 8        |                               |
| AE                  | 6605482         | 8/2003 | Celii et al.    | 438   | 16       |                               |
| AF                  | 6278809         | 8/2001 | Johnson et al.  | 385   | 17       |                               |
| AG                  | 5871805         | 2/1999 | Lemelson        | 427   | 8        |                               |
| AH                  |                 |        |                 |       |          |                               |
| AI                  |                 |        |                 |       |          |                               |
| AJ                  |                 |        |                 |       |          |                               |
| AK                  |                 |        |                 |       |          |                               |

**FOREIGN PATENT DOCUMENTS**

|    | DOCUMENT NUMBER | DATE | COUNTRY | CLASS | SUBCLASS | TRANSLATION |    |
|----|-----------------|------|---------|-------|----------|-------------|----|
|    |                 |      |         |       |          | YES         | NO |
| AL |                 |      |         |       |          |             |    |
| AM |                 |      |         |       |          |             |    |

**OTHER PRIOR ART (Including Author, Title, Date, Pertinent Pages, Etc.)**

|    |  |   |
|----|--|---|
| AR |  | Data Analysis for Spectroscopic Elliprometry,<br>Thin Solid Films 234 (1993) by Johnson Tr. |
| AS |  |   |

EXAMINER

DATE CONSIDERED

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.